Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

TITLE V (DRAFT) NO. V-06-026
E.I. DUPONT DE NEMOURS AND COMPANY
HC-66 400 HARRIS ROAD, WURTLAND, KY 41144
SEPTEMBER 29, 2006
CAROLINA ALONSO, REVIEWER
SOURCE I.D. #: 021-089-00001
SOURCE A.I. #: 1589
ACTIVITY #: APE20040001

SOURCE DESCRIPTION:

E.I. DuPont De Nemours and Company (DuPont) located in Wurtland, Kentucky, produces sulfuric acid, oleum, sulfur trioxide (SO_3), chlorosulfonic acid (CSA), and SO_3/CSA blend. The source is a major source, as defined by 401 KAR 52:020 Title V Permits, for the potential emissions of over 100 tons per year of sulfur dioxide (SO_2), and particulate matter less than 10 microns (PM_{10}). The source has several construction and state origin permits and has applied for a source wide Title V permit. The source is also a major source as defined in 401 KAR 51:001 for Prevention of Significant Deterioration of the Air Quality (PSD), however permit V-06-026 is not subject to PSD review. Significant emission points are described below.

Sulfuric Acid Production Process (EP 01):
The primary emission unit at the DuPont Wurtland facility is the sulfuric acid (H_2S0_4) production process. This process converts sulfur (S) to sulfur dioxide ($S0_2$), and then sulfur dioxide is converted to sulfur trioxide (SO_3) in the converter. SO_3 is then absorbed in H_2S0_4 in a series of absorbing towers. The sulfuric acid production process include the blower/turbine, dry tower, sulfur burner (natural gas), boiler #1, converter, boiler #2, superheater #1, superheater #2, economizer, oleum tower, absorbing tower, demister, and stack. Fugitive emissions from the acid production process may be emitted from 250 liquid valves, 25 pump seals, 10 relief devices, 1,500 liquid flanges, 1,500 vapor flanges, and 2 sample stations (listed as insignificant).

Oleum Storage and Barge Loading (EP 02):
The DuPont Wurtland Sulfuric Acid Plant operates three tanks used for storing oleum and one oleum barge loading area (not currently in use). Oleum is a solution of SO_3 in H_2S0_4. Two oleum storage tanks, identified as tanks #6 and #7, contain 65% oleum and one tank contains SO_3. The 65% oleum and SO_3 is loaded into rail cars and truck trailers. The facility is capable of loading oleum into rail cars at 5 locations and into truck trailers at one location.

Emergency Boiler (EP 03):
When the sulfuric acid production process is shut down or during an emergency, the emergency boiler is operated to prevent the molten sulfur (and other temperature sensitive materials) being fed to the process from solidifying in the process pipes and causing severe damage. The emergency boiler is also run occasionally to assure that it will be operational in the event of an emergency. The packaged boiler is fired by natural gas and has a heat output rating of 29.25 mmBtu/hr.

Chlorosulfonic Acid Reactor (EP 04):
The DuPont Wurtland facility produces chlorosulfonic acid (CSA) by the continuous reaction of anhydrous hydrogen chloride (HCl) with SO_3 in the CSA reactor. The reactor is capable of producing 106 tons of CSA per day.

Chlorosulfonic Acid Storage Tanks (EP 05 and EP 08):
The DuPont Wurtland facility owns three CSA storage tanks. CSA tanks #1 and #2 are permitted as emission point #05 and have capacities of approximately 13,000 gallons each. CSA tank #3 is has a capacity of approximately 210,000 gallons is identified as emission point #08 (listed as insignificant activity).

Chlorosulfonic Acid Loading Facility (EP 06):
Chlorosulfonic acid is loaded at five locations into rail cars and at one location into truck trailers.

Sulfuric Acid Bulk Storage Tanks (EP 07):
The DuPont Wurtland facility owns three tanks for storing non-fuming sulfuric acid. The tanks are identified as #5, #8, and #10.

CSA/SO_3 Blend Reactor (EP 09):
The DuPont Wurtland facility produces a CSA and SO_3 blend product in a 2,500-gallon capacity glass lined vessel known as the CSA/SO_3 blend reactor. The blend is produced in the reactor in batches. The process begins with the loading of CSA into the reactor. The reactor is then closed and the CSA is re-circulated while SO_3 is injected into the reactor via an eductor.

Blend Reactor Pipeline Equipment (EP 10):
The pipeline equipment, such as flanges and valves, associated with the CSA/SO_3 blend reactor are permitted as point 10. There are 32 liquid valves, 1 relief device, and 92 liquid flanges. This is an insignificant activity.

COMMENTS:
DuPont submitted an application for a source wide Title V permit on December 1, 1998 and a draft permit V-03-007 was out for public notice on May 8, 2003. Before permit V-03-007 was proposed, the Division decided that the permit needed to be redrafted and requested the application to be updated and resubmitted. DuPont submitted a new Title V application on January 28, 2004 for which draft permit V-06-026 is now being issued.

Type of control and efficiency:
A Brinks Mist Eliminator controls sulfuric acid mist emissions from the Main Stack with 95% efficiency. An SO_3 Scrubber and a Fume Abatement System are used to control sulfuric acid mist and hydrochloric acid mist emissions with 99.8% efficiency for sulfuric acid and 90% for hydrochloric acid.

Emission factors and their source:
AP–42, 5^{th} Edition, mass balances, and stack tests are the main sources for emission factors.

Applicable Regulations:
401 KAR 59:010, New Process Operations, applies to affected facilities commenced after July 2, 1975.
401 KAR 61:015, Existing Indirect Heat Exchangers, applies to affected facilities commenced before July 2, 1975.
401 KAR 61:030, Existing Sulfuric Acid Plants.
401 KAR 63:020, Potentially Hazardous Matter and Toxic Substances.
From permits O-91-007 and S-94-061, limits from 401 KAR 63:021, Existing Sources Emitting Toxic Air Pollutants and 401 KAR 63:022, New and Modified Sources Emitting Toxic Air Pollutants are also applicable.

Modeling:
As a response to a Notice of Deficiency dated November 7, 2003, DuPont submitted results for ISC3 modeling. DuPont modeled the emissions of ethylene glycol, sulfuric acid, dimethyl phthalate, and hydrogen chloride from their emission units. The following table was part of the modeling submittal:

Pollutant	Modeled Highest Annual Average (ug/m^3)	Standard (ug/m^3)	Source for Standard
Sulfuric Acid			
Year 1989 =	67.73405	200	ACGIH
Year 1990 =	53.16329	200	ACGIH
Year 1991 =	58.66413	200	ACGIH
Hydrogen Chloride			
Year 1989 =	9.3305	21	PRG
Year 1990 =	7.58458	21	PRG
Year 1991 =	7.63739	21	PRG
Ethylene Glycol			
Year 1989 =	0.02311	7300	PRG
Year 1990 =	0.01643	7300	PRG
Year 1991 =	0.01508	7300	PRG
Dimethyl phthalate			
Year 1989 =	0.02209	37000	PRG
Year 1990 =	0.0152	37000	PRG
Year 1991 =	0.01689	37000	PRG

When DuPont modeled for H_2SO_4 they also included SO_3 emission since SO_3 when it is exposed to the atmosphere will react with the moisture in the air to form H_2SO_4. Since sulfuric acid mist is a form of particulate matter, the above concentrations exceed the NAAQS (401 KAR 53:010, Appendix A) for particulate matter. The Division's modeling results do not show exceedances to NAAQS, therefore the Division requires that DuPont remodel sulfuric acid taking into consideration all units that emit particulate matter. Furthermore, the stack parameters must match the parameters listed in the most recent Title V application.

Modeling of SO_2 emissions is also required and 401 KAR 53:010 Appendix A will be taken as the standard for compliance. The stack parameters must match the parameters listed in the most recent Title V application.

EMISSION AND OPERATING CAPS DESCRIPTION:
The sulfuric acid production process has a rated capacity of 780 tons per day expressed as 100% sulfuric acid and a historically permitted annual capacity of 260,000 tons per year expressed as 100% sulfuric acid since emission estimates were based on this rate. The 260,000 tons 100% sulfuric acid per year production limit applies to sulfuric acid, oleum, sulfur trioxide, and chlorosulfonic acid along with the 32.5 tons 100% sulfuric acid per hour limit. Any other capacity information that has been supplied in the permit application has been included for information purposes only and is not meant to imply additional production limits on different types of acid produced.

Sulfur dioxide shall not exceed twenty-seven and six-tenths (27.6) pounds per ton of acid produced, the production being expressed as 100 percent sulfuric acid, pursuant to 401 KAR 61:030, Existing Sulfuric Acid Plants. The 27.6 lb/ton acid produced shall be based on 3-hour rolling average.

The following limits are also applicable:

Emission Point	**H_2SO_4 mist (lbs/ton of acid produced)** 401 KAR 61:030, Section 3	**H_2SO_4 mist (lbs/hr)** State-only requirement from O-91-007 401 KAR 63:021
01	0.5	9.289
02	0.5	0.149

Emission Point	**Particulate Matter (including H_2SO_4 and HCl mist) (lbs/hr)** 401 KAR 59:010	**H_2SO_4 mist (lbs/hr)** State-only requirement from O-91-007, S-94-061, 401 KAR 63:021	**HCl mist (lbs/hr)** State-only requirement from O-91-007, S-94-061, 401 KAR 63:021
04	9.1	0.378	0.717
05	9.1	0.011	0.056
06	9.1	0.075	0.385
09/10	2.87	3.871	0.933

Allowable emissions for particulate matter from the combustion sources have been recalculated according to information provided by the company and are specified in the permit under the appropriate emission points.

PERIODIC MONITORING:
Pursuant to 401 KAR 61:005, General Provisions, the owner or operator shall install, calibrate, maintain, and operate a continuous monitoring system (CMS) for SO_2 emissions.

OPERATIONAL FLEXIBILITY:
None

CREDIBLE EVIDENCE:
This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec.

51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.